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(54) Shelf-stable, non-aqueous spreadable fillings.

(57) A non-aqueous, lipid-based, stable, flavored coating having a smooth, non-grainy texture, spreadable at room temperature but capable of form retention when applied to a substrate at a temperature up to about 110°F.; comprising about 10-70% of a hydrogenated vegetable oil having a Wiley Melting Point less than about 90°F.; about 30-90% of a particulate friable, non-hygroscopic bulking agent; about 0 to a flavoring amount of a flavorant; and about .1 to about 8% of a lipid stabilizer having a Capillary Melting Point in the range of about 125-150°F., said vegetable oil and stabilizer defining on cooling a lipid matrix for the bulking agent, said bulking agent being substantially impalpable in the lipid matrix.

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SHELF-STABLE, NON-AQUEOUS SPREADABLE FILLINGS

The present invention relates to a smooth, uniform-textured, spreadable, savory filling, and particularly to one which is non-aqueous and stable at 5 normal ambient temperatures.

The savory filling of the present invention may have any of a number of different flavors, including chocolate, cheese, meat, vegetable, fowl or fish. The flavor can be synthetic or natural, such as might be 10 imparted by cocoa powder, peanut powder, or dried cheese powder.

For purposes of the present application, the term "coating" means a layer (on a substrate) which has perceptible thickness, by eye measurement, and also 15 mouth feel, as contrasted with a film. The term includes fillings, such as within an enveloping shell or sandwiched between a pair of substrates.

The term "non-aqueous" means substantially free of water. The coatings of the present invention, preferably, have a maximum moisture content of about 3½% by 20 weight.

By "stable" it is meant that the products of the present invention are both oxidative stable and heat stable. By "oxidative stable" it is meant that the 25 products can be stored for prolonged periods of time under normal ambient conditions, for instance from about 21°C. (70°F.) to about 43°C. (110°F.), without refrigeration.

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tion and without spoiling or degradation of the coating. By "heat stable", it is meant that the products of the present invention are resistant to oil separation under normal ambient conditions.

5 The term "spreadable" has its ordinary dictionary definition. Under ambient conditions, the coatings of the present invention can be readily spread onto a substrate using a knife, or the like. By "smooth" it is meant that the coatings of the present invention have a
10 non-grainy, uniform, plastic texture similar to butter or peanut butter, wherein solids in the coating are essentially impalpable. This does not preclude the addition of solids such as bacon bits, chive pieces and toasted onion chunks added to impart flavor or bite. In
15 such instances, the coatings of the present invention provide a matrix for the added solids, and the term "smooth" is applicable to the matrix.

BACKGROUND ART

20 It is well known to produce spreadable products, for instance peanut butter spreads and cheese spreads. A peanut butter spread is fairly unique as spreads go, comprising at least about 90% whole peanuts, the remaining 10% being sweetener, salt and stabilizer. The whole peanuts are about 40-50% peanut oil, the remainder being protein solids. Although peanut butter has a very pleasing taste and texture, the strong flavor of the whole peanuts, in such a dominant amount, by and large prevents the use of this formulation for spreads of a different flavor.

25 Other food spreads of various types, such as margarine, but also including cheese spreads, are almost universally based on aqueous systems and require product refrigeration once exposed to the atmosphere.

30 Prior patent No. 2,222,560 to Clickner describes a cheese-flavored composition which comprises spray dried cheese powder and a fat such as refined coconut oil or hydrogenated coconut, cottonseed, sesame, or corn oil.

The composition may comprise 15-20% cheese powder, and
is said to be substantially solid at room temperature,
having a consistency similar to butter. It is adapted
to be applied to popcorn or the like by melting and then
5 pouring or spraying, and would not be suitable for use in
a coated product of the type wherein heat stability was
required.

Prior patent No. 4,198,439 to Hoover describes
a peanut/cheese food product which is said to have a
10 long shelf life at room temperature and which can vary
in consistency from a firm cheddar cheese-like texture to
a soft spreadable consistency. The product appears to
be a marriage of peanut and cheese flavors, and comprises
about 50-80% ground roasted nuts, 10-40% dehydrated
15 cheese material, and 5-15% of an ingredient referred to
as a texture-modifying agent comprising non-hydrogenated
fat in combination with hydrogenated fat, glycerides and
mixtures thereof. The texture-modifying agent is stated
to have a Capillary Melting Point above 120°F. Varying
20 the ratio of hydrogenated to non-hydrogenated fat is
said to alter the texture from firm to soft, without
changing the total fat content. There is no teaching in
this patent concerning stabilizing an oil solids product.

In processing, the lipid ingredients are heated
25 until melted, and the ground roasted nuts are then added,
with mixing to a smooth consistency. Also added would
be an emulsifier such as lecithin, along with salt,
flavorants and colorants. The dehydrated cheese is then
blended in at a temperature of 60°C. (140°F.). This is
30 followed by packaging, although it is indicated that the
mixture can be passed through a colloid mill or homogenizer
prior to packaging.

The product is said to have a water activity
rating of less than about 0.7, thereby avoiding the need
35 for refrigerated storage.

Since the patent is directed essentially to a
means for combining peanut ingredients and cheese powders,

it is clearly limited to products where a peanut/cheese flavor is desired.

DISCLOSURE OF INVENTION

The present invention resides in a non-aqueous, 5 lipid-based, stable, flavored coating having a smooth, non-grainy texture, said coating being spreadable at room temperature but capable of form retention when applied to a substrate at a temperature up to about 110°F.; comprising about 10-70% of a hydrogenated vegetable oil 10 having a Wiley Melting Point less than about 32°C. (90°F.) and a Solids Fat Index at 38°C. (100°F.) of 1 maximum, at 32°C. (90°F.) of 3 maximum, and at 21°C. (70°F.) of 30 maximum; about 30-90% of a particulate friable, non-hygroscopic bulking agent, preferably selected from the 15 group consisting of cocoa powder, dried cheese powder, bland invert sugar, bland dairy-derived protein, bland vegetable protein, bland corn syrup solids, and flavor compatible combinations thereof; about 0 to a flavoring amount of a flavorant; and about .1 to about 8% of a 20 lipid stabilizer having a Capillary Melting Point in the range of about 51.5-65°C. (125-150°F.), preferably selected from the group consisting of a hard polyglycerol ester of a fatty acid, a hard mono-diglyceride and stearine; said coating being prepared by mixing the 25 ingredients thereof at a temperature sufficiently elevated to render the lipid components in a molten state, said vegetable oil and stabilizer defining on cooling a lipid matrix for the bulking agent, said bulking agent being substantially impalpable in the lipid matrix.

30 BEST MODE FOR CARRYING OUT THE INVENTION AND INDUSTRIAL APPLICABILITY

The major lipid component of the present invention is a hydrogenated vegetable oil having a Wiley Melting Point not substantially greater than about 32°C. (90°F.) and an AOM value of at least about 25 hours. The AOM value is determined by a known test referred to as the Accelerated Rancidity Test, the letters AOM standing

for Active Oxygen Method. The vegetable oil, preferably has a Solids Fat Index at 38°C. (100°F.) of 1 maximum, at 32°C. (90°F.) of 3 maximum, and at 21°C (70°F.) of 30 maximum.

5 Broadly, the vegetable oil can be any edible oil, or blend of oil and fat, coming within the parameters given, although a non-lauric oil is preferred which has both oxidative and hydrolytic stability. Examples of suitable non-lauric oils are winterized

10 salad oils, hydrogenated soybean oil, hydrogenated cottonseed oil, and a hydrogenated, fractionated palm oil.

A lauric oil such as 76° coconut oil may be used in a blend with a non-lauric oil, and this is broadly within the scope of the present invention. Being a lauric oil, it does not have hydrolytic stability, but since the present system is anhydrous, hydrolytic stability is not critical. Also, 76°F. coconut oil is by itself not suitable, being too brittle at

20 normal room temperature to give a spreadable product. The same is true of refined and hydrogenated palm kernel oil. However, in a blend with a non-lauric oil, both can be used in small amount.

Also, a hard butter such as a fractionated, hydrogenated soybean/cottonseed oil can be used in small amounts as part of the lipid component. As will be described, the oil/stabilizer system of the present invention provides a matrix for the coating, bulking ingredients, and the solids part of the stabilizer

30 generally is the ingredient which rigidifies the lipid system and prevents separation of oil and bulking solids. If a hard butter is used, its solids content can contribute to stabilization, so that less added stabilizer need be used. In this regard, a solid or plastic shortening can also be used in blend with a hydrogenated vegetable oil. The terms fat, hard butter, and plastic shortening are used herein in their common sense to

define or refer to normally plastic or hard lipid products. A critical factor is that the oil component of the product of the present invention, whether or not a blend having some hard butter or plastic shortening, 5 should have a maximum solids content at 21°C. (70°F.) of about 30, to provide a spreadable consistency at normal ambient temperatures.

One suitable such oil useful in the practice of the present invention is marketed under the trade-
10 mark Durkex 500, by SCM Corporation. This oil is a fractionated, hydrogenated, soybean/cottonseed oil mixture having a Wiley Melting Point of about 23°C. (73°F.), an AOM stability of at least about 350 hours, and a free fatty acid content of about 0.05% maximum. The oil has
15 an Iodine Value of about 74-81, is bland in flavor and light in color, having a Lovibond color maximum of about 7.0 Red.

Another suitable low-melting point oil is Durkex 100 (trademark SCM Corporation), a partially hydrogenated soybean oil having a Wiley Melting Point of about 18°C. (65°F.) and an SFI at 10°C. (50°F.) of about 11 maximum. Durkex 100 has an IV of about 85-90 maximum. It has an AOM stability of about 90 hours minimum, and a maximum Lovibond color of about 1.5 R. This product, as with Durkex 500, is bland in flavor.
25

An example of a winterized salad oil that can be employed is Durkex 25 (trademark, SCM Corporation), a partially hydrogenated soybean oil having an A.O.M. stability of 25 hours, a free fatty acid content of .05% maximum, and a color of 2R maximum.

30 An example of a hydrogenated palm oil fraction suitable in the practice of the present invention is one having a Wiley Melting Point of about 30-32°C. (86-90°F.) and an SFI of about 10 minimum at 27°C. (80°F.), 3 maximum at 33°C. (92°F.), and 1 maximum at 38°C. (100°F.). At 21°C. (70°F.), it has an SFI of about 30.

35 Coconut oil, with a Wiley Melting Point of 23-27°C. (73-79°F.), (such as that marketed by SCM

Corporation under the trademark Konut) may also be used as a lauric component in blend with a non-lauric oil. This oil has a Lovibond color of 1.5 R (maximum) and an AOM value of 100 hours (minimum), and may have special 5 usefulness in spreads suitable for warmer climates.

A suitable plastic shortening that can be used in blend with an oil is Kaola-D shortening (trademark, SCM Corporation), which has a Wiley Melting Point of about 98-104°F., a bland flavor, an AOM of 150 minimum, 10 and a Solids Fat Index of 43 at 50°F., 24 at 21°C. (70°F.), 15 at 27°C. (80°F.), 7 at 33°C. (92°F.), and 15 3 at 38°C. (100°F.). This shortening is made from hydrogenated soybean and palm kernal oil. Also useful, is a non-hydrogenated, non-lauric, 40-48 IV mid-fraction of palm oil which has a Mettler Dropping Point of 31 $^{\pm}$ 2°C. and a Solids Fat Index of 55 minimum at 10°C. (50°F.), 30 minimum at 21°C. (70°F.), 10 minimum at 27°C. (80°F.), 3 maximum at 33°C. (92°F.), and 1 maximum at 38°C. (100°F.). A hard butter 20 example is Kaomel (trademark, SCM Corporation), a hydrogenated and fractionated soybean/cottonseed oil having a Wiley Melting Point of about 97-101°F., and an SFI as follows:

	<u>Temperature</u>	<u>Approx. % Solids</u>
25	10°C. (50°F.)	69 min.
	21°C. (70°F.)	59 min.
	27°C. (80°F.)	52 min.
	33°C. (92°F.)	22 min.
	38°C. (100°F.)	5 max.

30 In the above examples, the Wiley Melting Point was determined by AOCS method Cc-2-38. The approximate SFI was determined by AOCS method Cd-10-57.

The bulking ingredient of the present invention can be ordinary cocoa powder or dry cheese powder. 35 Prior application Serial No. 402,884, assigned to assignee of the present application, contains a detailed description of dried cheese powder ingredients which

may be employed. These may be employed alone or as blends, or in combination with cheese flavors (which are cheese powders with other ingredients). The cheese powders are simply dehydrated cheese, usually spray 5 dried powders, and many have a relatively high butter-fat and/or vegetable fat content of, for instance, about 20 to about 46%, although, broadly, the cheese powders can vary all the way from about 60% fat down to as little as 0-10% fat. Also within the scope of the 10 present invention are enzyme modified cheese powders. The cheese powders are available in a number of different flavors, for instance, Swiss, Cheddar, aged or unaged, and, perhaps, colored or uncolored. Preferably, the cheese powders are marketed with a moisture content of 15 less than about 10%, preferably less than about 5%. The following Table 1 is a list of representative Swiss and Cheddar cheese powders and flavors that may be employed in the practice of the present invention, either alone or in blends:

TABLE 1
CHEESE POWDERS

<u>Trademark</u>	<u>Flavor</u>	<u>Min. Fat Content</u>	<u>Moisture Content Max.</u>	<u>Ingredient Declaration</u>
Beatnrene 1326	Aged Cheddar	46%	3.5%	Cheddar cheese solids/ sodium phosphate
Beatnrene 1412	Mild Cheddar	46%	3.5%	Manufactured from un- colored non-aged Cheddar cheese.
Cheztone 100	Cheddar	32%	4.0%	Cheddar cheese solids, cultured non-fat milk solids, whey solids, hydrogenated shortening, salt, sodium phosphate; same as Cheztoner 100 but with coloring.
Cheztoner 101	Cheddar	32%	4.0%	Cheddar cheese solids
Beatone 101	Cheddar (high flavor powder)	46%	3.5%	Swiss cheese solids/ sodium phosphate
Beatnrene 1923	Typical Swiss	39%	3.5%	Enzyme modified swiss cheese solids, non-fat milk solids, sodium citrate.
Beatone 700	Swiss flavor	20%	4.0%	Swiss cheese solids, cultured non-fat milk solids, sodium phosphate.
Cheztoner 700	Swiss	20%	4.0%	

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The cheese powders and flavors of Table 1 are marketed by Beatrice Foods Co. In addition to the cheese powders of Table 1, the following can be used:

TABLE 2

5	Borden Co. #3653	Cheddar cheese, hydrogenated vegetable oil, buttermilk solids, salt, sodium phosphate, sodium hexametaphosphate, citric acid, lactic acid, and artificial color.
10	Nutritek 250 (Foremost Foods)	Whole milk cheese whey with 25% of the mineral salts removed.
15	Borden Zest 13653	
15	Borden Co. #90	Cheddar cheese, hydrogenated vegetable oil, condensed buttermilk, sodium chloride, disodium phosphate, sodium hexametaphosphate, citric acid, lactic acid, artificial color.
20	Borden Co. #87	Swiss cheese flavoring powder alternative to Chezton 700.
25	Land-O-Lakes dried Process Cheese #5540	Spray dried process cheese produced by removing moisture from processed American cheese by spray drying; fat content 46.5%, moisture 4%.
30	Land-O-Lakes #9809	Spray dried Blue cheese produced by removing the moisture from aged Blue cheese; fat content 41%, moisture 4%.
35	Land-O-Lakes Cheddease 250	Cheddar cheese in powder form - contains also buttermilk, whey butter, salt, sodium phosphate, flavoring, MSG, coloring; fat content 25%, moisture 4%.

The disclosure of S.N. 402,884 is incorporated by reference herein.

In addition to the above ingredients, one can employ a bland, friable, non-hygroscopic bulking ingredient such as described in prior application Serial No. 402,884, filed February 6, 1984, also assigned to assignee of the present application. As disclosed in S.N. 577,393, the bulking ingredient should be comprised of inert particles capable of being non-gritty in the

lipid phase, either rendered so by conventional confectionery refining techniques or by separate particle size reduction of the bulking ingredient and adding the ground particulates to the lipid phase. For this purpose, a principal requirement of the bulking ingredient is that it be friable, having a friability factor approximately equivalent to that of sugar. Attrition of the bulking particles can be carried out in a number of ways, for instance, in a hammer mill, a ball mill, or a roll mill. It also may be desirable, for optimum control of properties of the finished product, that the bulking particles be substantially free of fat which would function as a diluent of the lipid phase. The bulking particles, as mentioned, preferably, are bland in taste, to avoid masking or adversely affecting the other flavors which may be added. The particles are preferably non-hygroscopic, equivalent in this regard, as well, to sugar, to avoid water pickup prior to processing. Water can adversely affect processing during refining, and/or conching, causing undesired agglomeration, as is well known in confectionery practice. Those particles which are bland in taste and at the same time have a high degree of friability and non-hygroscopicity approximating that of sugar, are disaccharides, such as lactose or whey. Whey is very high in lactose content. The whey can be demineralized whey or sweet dairy whey. Sweet dairy whey has a slight saltiness, which may be advantageous or disadvantageous, depending upon the dominant flavor desired.

The bulking particles of this invention can also include friable, dairy-derived food additives such as non-fat dry milk and non-fat buttermilk solids, both well known ingredients in confectionery formulations. Another useful ingredient is a protein, one that is bland in flavor, such as defatted soy protein. A friable protein such as a caseinate can also be used. The protein provides nutrition and also a desired astringency.

A textured vegetable protein can be used. Another category of ingredients that can be used is a bland, hydrolyzed, non-hygroscopic, friable starch, such as a low DE corn syrup solid, preferably having a dextrose equivalent less than about 15, e.g., maltodextrin.

5 Many other bulking ingredients will be apparent to those skilled in the art, and many will be developed in the future since this is an area of rapidly developing technology. The present invention is not limited to specific ingredients. It is necessary only that they be bland or complementary in flavor with the dominant flavor desired, that they be friable and non-hygroscopic.

10 By being friable, they resist agglomeration and can be reduced in particle size so that they are substantially impalpable in the coating. For purposes of the present application, the term friable means that the bulking ingredients are capable of a size reduction to not substantially greater than 50 microns average particle size.

15

The disclosure of S.N. 577,393 is incorporated by reference herein.

The bulking component of the present invention can also comprise flavor-compatible combinations of the above ingredients. For instance, with the cocoa powder, one may advantageously employ a dairy-derived bulking ingredient such as non-fat dry milk solid or buttermilk solids, following conventional confectionary practice. In addition, one may employ an amount of an invert sugar such as lactose, or even sucrose or dextrose, depending upon the amount of sweetness desired. Similarly, with the cheese powders, one may wish to employ an amount of a bland bulking ingredient such as non-fat dry milk solids or an invert sugar, preferably bland, such as lactose.

In the case of other savory flavors such as meat, fowl, fish or vegetable, flavorful bulking ingredients such as cheese and cocoa powder may not be desirable or compatible, and in such case the bulking ingre-

dient might be solely a blend of such ingredients as called for in copending application Serial No. 577,393. In that application, it was described that a combination of bulking ingredients was desirable. Specifically, a
5 preferred bulking agent comprised at least 15% of a bland, dairy-derived, friable carbohydrate such as lactose, whey, or a blend thereof. On a parts basis, the bulking agent preferably comprised about 15-40 parts carbohydrate (either lactose, whey, or a blend thereof);
10 approximately 0-30 parts maltodextrin or other bland, low DE hydrolyzed starch; and approximately 0-30 parts of a defatted soy protein or other friable, bland, non-hygrosopic protein having a high protein content. As was pointed out in the specification for S.N. 577,393,
15 the dairy-derived ingredients such as non-fat dry milk solids and non-fat buttermilk solids may have too much flavor for many delicate flavors, such as a meat, fish or vegetable flavor. However, it is within the scope of the present invention that these materials can be included in small amounts. The protein component is advantageous in that it provides nutrition and also a desired astringency advantageous with such flavors as meat, fish or fowl. Carbohydrates such as lactose or whey have a slight milky flavor, and soy protein a
20 slight beany flavor, so that a desirable ingredient of the base, to dilute the flavors of these ingredients, is a bland, hydrolyzed non-hygrosopic, friable starch such as a low DE corn syrup solid having a dextrose equivalent less than about 15, e.g., maltodextrin.
25 Broadly, the stabilizer component of the present invention is any high melting point, edible lipid having a Capillary Melting Point in the range of about 51.5-65°C. (125-150°F.). The function of the stabilizer is to go quickly to a stable crystal form on cooling
30 from a molten state during preparation of the coatings of the present invention, and to form a stable crystal matrix effective to trap the oil component before it has
35

a chance to separate from the solids or bulking ingredient or ingredients of the coating. Also at the temperature of application to a substrate, which, by way of example, may be about 110°F., the amount of crystal
5 solids matrix provided by the stabilizer is critical to prevent oil separation.

Examples of high melting point lipids suitable to function as a stabilizer are high melting point emulsifiers and stearines. Specific examples of suitable
10 emulsifiers are certain polyglycerol esters of fatty acids, mono-diglycerides, and derivatives of mono-diglycerides such as succinylated or ethoxylated mono-diglycerides.

A preferred stabilizer is Santone 3-1-S (trademark, SCM Corporation), which is triglycerol monostearate (a polyglycerol ester) having a Capillary Melting Point of about 127°F.-131°F. This emulsifier is lipophilic, having an HLB of about 7.2. The emulsifier need not be lipophilic. Santone 8-1-S (trademark, SCM Corporation)
20 which is octaglycerol monostearate, has a Capillary Melting Point of about 131-137°F., and can be successfully used. This compound has an HLB value of about 13 and is hydrophilic.

A suitable mono-diglyceride emulsifier is Dur-em 127 (trademark, SCM Corporation). This compound has a monoglyceride content of about 40% minimum, an IV of 5 max., and a Capillary Melting Point of about 136-143°F. The compound is marketed as a peanut butter stabilizer. A blend of mono-diglycerides and sodium
30 stearoyl lactylate, marketed by SCM Corporation under the trademark CW-6, which has a Capillary Melting Point of 130-140°F., would also be functional. Also, a mixture of mono-diglycerides and ethoxylated mono-diglycerides having a melting point of about 125-130°F. would be
35 functional.

The stabilizer as mentioned can also be a stearine, which is the high melting point distillation

residue from the fractionation of an oil such as cotton-seed oil, palm oil or soybean oil. One suitable stearine marketed by SCM Corporation is Durkee 27 (trademark) a partially hydrogenated palm oil stearine having a

5 Capillary Melting Point of about 136-148°F. This compound has an IV of 5 max. and a free fatty acid content of 10% max. It also is marketed as a peanut butter stabilizer. Palm stearine is preferred as it goes quickly from a molten condition into its stable crystal form

10 when cooled, due to the presence of a large amount of palmitic acid.

The amount of stabilizer required can vary anywhere between about .1% to about 8% (based on the weight of the entire composition) and is dependent upon

15 the respective Wiley Melting Points of the oil base employed and the stabilizing agent. The higher the melting point of the stabilizer, the more solids that will be provided by it, and the less the amount of the stabilizer that will be required. For instance, with a

20 composition containing Durkex 500 as the oil base, the amount of stabilizer necessary, with the use of a high melting point stearine, such as Durkee 27, or emulsifier such as Santone 3-l-S, may be as little as about 2%. If a hard butter is used in blend with the liquid oil, such

25 as in a blend of 80% Durkex 500 and 20% Kaomel, as little as .1% stabilizer may be necessary. If the base oil is a salad oil, such as Durkex 25, and no hard butter or plastic shortening is used, the amount of stabilizer needed may be as high as about 7%.

30 The amount of stabilizer required is also dependent on the relative proportions of oil base and bulking agent, a larger amount of oil requiring a proportionately larger amount of stabilizer. The above proportions (amounts of stabilizer) were typical for a

35 composition having about equal proportions of oil base and bulking agent, e.g., cheese powder, carbohydrate, cocoa powder and the like.

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Another factor, also, is particle size. The smaller the particle size, the less likely there is for oil separation. A coarse particle size for the bulking agent may require more stabilizer.

5 In this regard, broadly, the amount of matrix forming added oil employed is about 10-70% based on the weight of the entire composition, and the amount of bulking agent employed, broadly, is about 30-90%. Within the above ranges, the specific amount of added oil used
10 is a matrix forming amount, dependent upon the melting point of the oil, amount and particle size of the bulking agent, amount of stabilizer, and available fat in the bulking agents employed. Most cheese powders have fat, about 70-75% of which is released under the conditions of processing of the instant coatings. Whole milk
15 powders and buttermilk powders also contain releasable fat. For instance, Beatreme 1326 (a cheese powder) with about 46% fat, when used in an amount of about 32%, basis whole composition, provides flavor, and, under
20 conditions of processing, releases about 10% fat (again, basis whole composition). In this example, only about 30-35% added oil need be used. If the bulking agent is entirely fat free, using defatted powders the amount of added oil can be as high as 70%. This may be necessary since some oil can be absorbed by the powders,
25 making the oil absorbed unavailable as a contributor to viscosity. At the opposite end of the range, with powders having a large amount of releasable fat, the amount of added oil need be only 10%. Preferably, powders or
30 bulking agents are used which contribute about 5 to 15% fat to the composition, so that the added oil required is only in the range of about 25-40% of the composition, preferably about 30-35%.

The specific limits depend upon the viscosity
35 desired. The coatings of the present invention require stand-up or form retention in addition to being spreadable, at both application and ambient temperatures.

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Thus, the amount of bulking agent required (which is approximately total composition minus oil) can be said to be a form-retention amount at one end of the scale. At the opposite end, the amount of oil is a film-forming 5 or binding amount; more specifically, it has to be that amount needed to make a viscous product, to provide viscosity, or that necessary to take a viscosity reading.

Some of the emulsifiers useful as stabilizers also function as aerating agents, and aeration 10 may be desired. For instance, in a blend comprising lipids in the ratio of about 85:15:3-4, Durkex 500, Kaomel, and Santone 3-1-S, respectively, the amount of stabilizer (3-4 parts) is in excess of that needed for stabilization and some aeration 15 will occur with high-speed mixing.

The following Examples are illustrative of the present invention.

EXAMPLE 1

The following formulation was employed:

	<u>Ingredient</u>	<u>Parts (%)</u>
20	Beatreme 1326	31.8
	Durkex 500	34.1
	Santone 3-1-S	3.0
	Skim milk solids	10.3
25	Dry fat buttermilk solids	10.3
	Lactose	<u>10.4</u>
		<u>99.9</u>

The ratio of oil base to stabilizer was about about 92:8.

30 The lipid and bulking ingredients were separately mixed, the former in a kettle at about 65°C. (150°F.). The latter were pulverized to less than 50 microns average particle size at about 21°C. (70°F.), using a conventional roll mill. A mixer maintained at about 35 65°C. (150°F.) was provided for bringing the two ingredients together and providing a homogeneous mix.

Following mixing, the composition was screened

to remove agglomerated particles, with recycle of the same back to the mixer, and then portions were passed through a heat exchanger to reduce temperature in the range of about 21-43°C. (70-110°F.). Some portions 5 were extruded onto a cracker substrate and some were simply deposited by a non-extrusion method, all to a thickness of about 6.4 mm (1/4 inch), plus or minus. In all instances, the product, on cooling, had a smooth, homogeneous, but spreadable consistency, a soft non-10 gritty cheese texture and a clear cheese flavor. All products were both heat and oxidative stable.

As an alternative to immediate application to a substrate, the compositions can be deposited in a package at 21-43°C. (70-110°F.), and then later removed 15 from the package and applied to a substrate. An example would be where the compositions were marketed as a dip.

The specific application temperature used depends upon type of end use application. It is well known fat technology that a higher application temperature, e.g., 43°C. (110°F.), allows more crystal growth, 20 giving a firmer product. A lower application temperature gives less crystal growth and a more fluid product.

EXAMPLE 2

In this Example, a blend of cheese powders and 25 flavors were used to provide a cheese/jalapeno product. The following formulation was employed:

	<u>Ingredient</u>	<u>Parts (%)</u>
	1. Cheese powders	32.3
30	Parmesan M-163 (Land O'Lakes)	24.8
	Sour Cream 36 (Mid America)	5.0
	Blue cheese (Land O'Lakes)	2.5
	2. Lipids	40.0
	Durkex 500	37.0
	Santone 3-l-S	3.0
35	3. Bulking agents	25.95
	Lactose	7.04
	Maltodextrin M-040 (Grain Processing)	7.04
	Buttermilk solids	5.00
	Non-fat dry milk	5.00

EXAMPLE 2 (con't)

Dextrose 1.87
 4. Flavorants including
 Jalapeno powder (.20%) 1.75
 5 The ingredients were blended, mixed and applied
 to a substrate as in Example 1, and as in Example 1, gave
 a homogeneous product which was smooth in consistency,
 non-gritty, slightly chewy as in a soft cheese, spread-
 able, and both heat and oxidative stable.

10 EXAMPLES 3-7

These Examples illustrate the concept of the
 present invention with different lipid systems. The
 cheese powders and bulking agents were those used in
 Example 1, and the procedures employed were also the
 15 same as in Example 1.

LEGEND: OIL SYSTEMS

Example 3 - Durkex 25 - Winterized oil

Example 4 - Durkex 100 - 65° Max. WMP

Example 5 - Durkex 500 - 73° Max. WMP

20 Example 6 - Durkex 100/Durkex 500 - 70° Max. WMP

STABILIZER/AERATING AGENT - SANTONE 3-1-S

<u>Examples</u>	<u>% Oil</u>	<u>% Stabilizer</u>	<u>% Spray Dried Cheese Powders</u>	<u>Bulking Agents (%)</u>
3	37.0	4.0	32.0	27.0
25 4	37.0	3.0	32.0	28.0
5	37.0	2.5	32.0	28.5
6	37.0	2.8	32.0	28.2

In all instances, the results obtained were
 essentially the same as in Example 1. It can be noted
 30 that the amount of stabilizer required was higher (4%)
 with the use of a winterized salad oil than with the use
 of Durkex 500, a somewhat higher melting point oil (2.5%).

The products of the present invention all
 exhibited good mouthfeel and flavor release, with a
 35 quick melt-a-way providing a pleasing cooling sensation
 without a waxy residue. On a substrate, and after
 prolonged storage at ambient temperatures, they showed
 no oil separation, or moisture or oxygen degradation.

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Examples of uses found suitable for the compositions were as snack spreads, dips, sandwich and cracker cremes, extrudable confectionary centers, anhydrous icings, granola binders and soft truffles.

5 In the practice of the present invention, alternative procedures for preparation of the coatings and application to a substrate are available.

One example would be to blend all of the ingredients, including lipids, stabilizer, cheese powders, 10 bulking agents and flavor systems, in a ribbon blender at an elevated temperature of about 38°C. (100°F.), subject them to milling in a ball mill or the like at about 65°C. (150°F.), and then screen the milled product with recycle of large particles back to the ball mill, 15 followed by application to a substrate or packaging at 21-43°C. (70-110°F.). A heat exchanger would reduce the product temperature after milling and screening to the temperature range desired for coating or packaging.

An advantage of this procedure is that the 20 product of the present invention can be made in as few as three steps; in essence, ribbon blending, ball milling and extrusion or the like, thereby substantially reducing the cost of manufacture. The ingredients or components of the present invention lend themselves well to this 25 alternative procedure.

A further alternative would be to use conventional confectionary practices. By way of example, the 30 bulking agents, which may include cheese powders, and flavor systems, would be first blended together in a ribbon blender. A part of the oil and stabilizer would also be added to the ribbon blender, and the blend would be roll refined in a three or five roll refiner. The product of the refiner could either be subjected to simple mixing at about 65°C. (150°F.) or conching at 35 65°C. (150°F.), with addition of the balance of the oil and stabilizer to the concher or mixer, whichever is chosen. This product would then be passed through a

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heat exchanger to reduce temperature and then extruded or packaged at about 21-43°C. (70-110°F.), as in the above examples. This procedure may be useful with certain types of spreadable coatings.

-1-

C L A I M S

1. A non-aqueous, lipid-based, stable, flavored filling which is spreadable at normal room temperature but capable of form retention when applied to a substrate at a temperature up to about 43°C. (110°F.); comprising
 - about 10-70% of a hydrogenated vegetable oil having in proportions based on the weight of the filling as AOM stability of at least about 25 hours a Wiley Melting Point less than about 32°C. (90°F.) and a Solids Fat Index at 38°C. (100°F.) of 1 maximum, at 32°C. (90°F.) of 3 maximum, and at 21°C. (70°F.) of 30 maximum;
 - about 30-90% of a particulate, friable, non-hygrosopic, bulking agent;
 - zero to a flavoring amount of a flavorant;
 - about .1 to about 8% of a stabilizing lipid having a Capillary Melting Point in the range of about 51.5-65°C. (125-150°F.);said filling being prepared by mixing the ingredients thereof at a temperature sufficiently elevated to render the lipid components in a molten state, said vegetable oil and stabilizer defining on cooling a lipid matrix for the bulking agent, said bulking agent being substantially impalpable in the lipid matrix.
2. The filling of claim 1, wherein said bulking agent is sufficiently friable that it is capable of size reduction to not substantially greater than 50 microns average particle size.
3. The filling of claim 2, wherein said bulking agent is selected from the group consisting of cocoa powder, dried cheese powder, mono and disaccharides, bland dairy-derived protein, bland vegetable protein, bland hydrolyzed corn syrup solids, and flavor compatible combinations thereof.
4. The filling of claims 1, 2 or 3, wherein said stabilizing lipid is selected from the group consisting of high melting point emulsifiers, or high melting point

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stearines.

5. The filling of claim 4, wherein said stabilizing lipid is triglycerol monostearate.
6. The filling of claim 4, wherein said stabilizing lipid is a hard mono-diglyceride or a derivative thereof.
7. The filling of claims 1, 2 or 3, wherein said vegetable oil is a blend comprising a hydrogenated liquid vegetable oil and hydrogenated plastic or hard fat.
8. The filling of claims 1, 2 or 3, wherein said vegetable oil is a salad oil.
9. The filling of claim 1, wherein said bulking agent contains fat, which, contributing about 5-15% fat to the filling composition, said vegetable oil being about 25-40% of the filling.
10. A substrate containing the filling of claims 1, 2, 3 or 9.
11. A process for preparing a filling according to any one of the preceding claims, characterized by cooling a mixture of the stated components from an elevated temperature at a controlled rate effective to obtain controlled crystal growth.
12. A process according to claim 11, wherein said cooling is to a temperature in the range 21-38°C. (70-110°F.).
13. A process according to either of claims 11 and 12, wherein said cooling takes place in a heat exchanger.



European Patent
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EUROPEAN SEARCH REPORT

0165720
Application number

EP 85 30 3648

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
X	FR-A-2 310 704 (FROMAGERIES BEL - LA VACHE QUI RIT) * Claims 1-3; page 2, lines 9-28 *	1-4, 10	A 23 D 5/00 A 23 D 5/02 A 23 C 19/093 A 23 L 1/30
X	--- GB-A-1 516 374 (PROCTER & GAMBLE) * Claims 1,2,8; examples I,II,III; column 4, lines 43-55 *	1,3-7, 10,11, 13	
X	--- GB-A-1 458 568 (PROCTER & GAMBLE) * Claims 1,2,16; page 6, lines 40-65; example *	1,3-7, 10-12	
P,X	--- EP-A-0 121 253 (NABISCO BRANDS) * Claims 1,2,4,5,6,8,11,12; page 6, paragraphs 2,3; page 7, paragraphs 1,2; page 8, table I *	1,3,4, 9-11	TECHNICAL FIELDS SEARCHED (Int. Cl.4) A 23 D A 23 C A 23 L
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	30-08-1985	PEETERS J.C.	
CATEGORY OF CITED DOCUMENTS		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			